

FORCE XXI LOGISTICS: BONANZA OR BUST FOR THE MANEUVER COMMANDER

**A MONOGRAPH
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First Term AY 97-98

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DTIC QUALITY INSPECTED 3

19980324 116

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.				
1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE 18 December 1997	3. REPORT TYPE AND DATES COVERED MONOGRAPH		
4. TITLE AND SUBTITLE Force XXI Logistics: Bonanza or Bust for the Maneuver Commander		5. FUNDING NUMBERS		
6. AUTHOR(S) MAS Carl D. Bird III				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) SCHOOL OF ADVANCED MILITARY STUDIES COMMAND AND GENERAL STAFF COLLEGE FORT LEAVENWORTH, KANSAS 66027		8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) COMMAND AND GENERAL STAFF COLLEGE FORT LEAVENWORTH, KANSAS 66027		10. SPONSORING / MONITORING AGENCY REPORT NUMBER		
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION / AVAILABILITY STATEMENT DISTRIBUTION UNLIMITED		12b. DISTRIBUTION CODE		
13. ABSTRACT (Maximum 200 words) SEE ATTACHED				
14. SUBJECT TERMS Force XXI Logistics, AWE, Supply, maintenance, Transport, Logistic Functions.		15. NUMBER OF PAGES 49		16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED		18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED		
19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED		20. LIMITATION OF ABSTRACT UNLIMITED		

SCHOOL OF ADVANCED MILITARY STUDIES
MONOGRAPH APPROVAL

Major Carl D. Bird III

Title of Monograph: *Force XXI Logistics: Bonanza or Bust for the Maneuver*

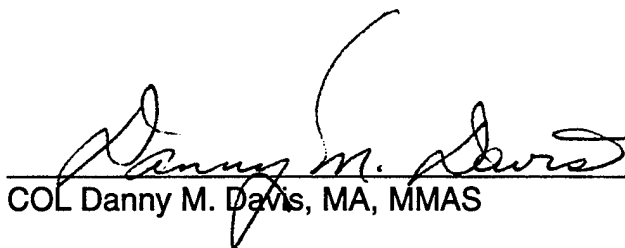
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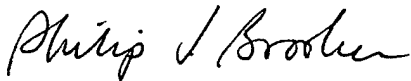
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Accepted this 18th Day of December 1997

DTIC QUALITY INSPECTED 3

ABSTRACT

Force XXI Logistics: Bonanza or Bust for the Maneuver Commander by Major Carl D. Bird III, USA, 49 Pages.

As the army organizes to fight in the 21st Century, logisticians will need the capabilities to keep pace with the high technology weapons of the modern battlefield. The maneuver forces will be smaller, more lethal, more dispersed and highly mobile. The support structures of this future division will integrate the logistic capabilities of the combat battalions, consolidating the functions of supply, maintenance, and medical support into the structure of the brigade's Forward Support Battalion. The consolidation of assets will allow increased capability while realizing the benefits of reduction in redundant functions. This, coupled with technology enhancements, will make the logistic structure more capable, forward looking, and give it an ability to keep pace with the mobility of the combat units. This monograph examines the question of the implications of Force XXI logistics on the maneuver commander.

The monograph accomplishes this assessment by comparing future doctrine to current doctrine. This allows us to develop a useful framework in which to apply technologies to increase the functions and characteristics of logistical operations. It also permits evaluation of the differences in the current versus future doctrines to analyze the impact of these changes on the brigade. Next the monograph compares the current logistic structure at brigade level to the future brigade logistic structure. This permits observation of the differences and assessment of the impact on the brigade. The paper then assesses capabilities of the two organizations in order to identify the shortfalls in logistic support and the increased benefits of technology on those shortfalls.

Finally, the monograph comes to a conclusion on the impacts of Force XXI logistic technology on the maneuver brigade. The monograph shows that the benefits for the brigade are manifested in the form of increased asset visibility, greater anticipation of supply requirements, logistic tailorability, modularity, support further forward on the battlefield, faster synchronization of logistic assets, greater protection of logistic assets, increased response time, and enhanced command and control for CSS units. These advantages, despite the reduced capabilities of the Forward Support Battalion, make Force XXI logistics a bonanza for the maneuver commander.

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CHAPTER I: INTRODUCTION

“The effectiveness of future military operations will be tied to the CSS capability to project, receive, and support the force.”¹

TRADOC Pam 525-5
Force XXI Operations
1 August 1994

Section 1. Background

Since the war in Vietnam, the battalion commander has had a logistics capability in the Headquarters Company of the battalion. This has consisted of a Support Platoon, Medical Platoon, and a Maintenance Platoon. In combat operations, these three platoons, under the S1, S4 and Executive Officer (XO), formed the logistic trains of the battalion. These platoons have provided the battalion commander with a level of flexibility and responsiveness close to real time. Under Conservative Heavy Interim Design-Objective (CHID-O), the brigade commander is deemed to be the primary maneuver commander.² The logistic assets of the battalion are consolidated to form a Forward Support Company (FSC) under the command of the Forward Support Battalion (FSB), which falls under the control of the brigade. This company has the same mission as the current three platoons, however, command of the company will fall to the FSB commander.

The two purposes of this reorganization are to relieve the maneuver commanders of detailed logistic burdens so that they may focus on fighting their units, and to consolidate the logistic assets assigned to the brigade in order to increase efficiency while enjoying the benefits realized by new technologies and a reduction of unnecessary duplication of effort. The final draft of CSS Operations in Support of Force XXI

Division Redesign, which articulates the vision of the future logistics structure, states, "The creation of multi-functional logistics companies within the Force XXI forward support battalion (FSB) will allow consolidation of CSS organizational elements currently embedded within the maneuver battalion with the DS capability currently in the FSB. The consolidation of these elements will be accomplished where it will enhance efficiencies and/or effectiveness."³

Section 2. Purpose

The purpose of this monograph is to determine the implications of Force XXI Logistics, in relation to the maneuver brigade, using the CHID-O. Today's army is a more lethal and technology-based force. The Army Warfighting Experiment at Fort Hood is the test bed for concepts of operation and technologies upon which our ground maneuver forces will rely in the future. It is assumed that changes in technology will be realized in the form of a smaller but more highly lethal force capable of facing the threats of the 21st century. This force is expected to be highly mobile and contain complex technological systems. Information dominance will be the force's principal advantage. Along with this revolution in military technology, concepts, and forces; the United States Army will require a logistics capability that can fix these complex systems on the battlefield, sustain the more mobile soldiers, and fuel the weapon systems wherever they may be.

Training and Doctrine Command (TRADOC) Pamphlet (PAM) 525-5, which articulates the vision of the future force, says, "The focus of the tactical logistician is on the logistics sinews of manning, arming, fueling, fixing, moving, and sustaining the

soldier and his equipment. Tactical logistics will continue to be one of the keys to more rapid tempo of operations. Anticipation [of requirements], long a goal of logisticians, can be aided by telemetry applied to both soldiers and equipment.”⁴ This will enable the future logistician to have complete visibility over all classes of supplies, an awareness of the battlefield on par with the maneuver force’s and a system that is more flexible. It is upon the last point that this monograph will focus.

This paper will answer the question, What are the implications of Force XXI logistics on the maneuver commander? In order to achieve its purpose, the monograph will look at current and future doctrine to set the conditions in which it can analyze the Force XXI logistics structure. The paper will compare and contrast the current logistics structure and capabilities for a heavy division and that of the Force XXI division, using the CHID-O design. Specific technological enablers, will then be discussed in order to ascertain if these will reduce any shortfall in logistics capability between the two structures. This will enable an analysis of data for the two units, based on the previously discussed doctrine and capabilities of the two organizations. The monograph will then come to a conclusion answering the research question.

In order to answer the primary research question the following subordinate questions must be answered:

What is the current doctrine for logistic operations in the Division?;

What is the future doctrine for logistic operations in the Force XXI Division?;

What are the differences in structures and capabilities of the current system as compared to the Force XXI system?;

What are the roles and responsibilities of the Forward Support Battalion and Forward Support Company?; and

What is the impact of technology on Force XXI logistic operations?

The scope of this paper focuses at brigade level and the assets associated with a brigade task force. This paper will not address logistics above Division level or the impact the Corps Support Command (COSCOM) will have on the two logistics structures. This monograph will base all capabilities on a Heavy Division design and will not address the Mechanized Infantry Division or Light Division structures. Specifically, this monograph uses an Armor Brigade as the basis of all discussion. The design of the Force XXI logistic structure is based on the CHID-O and will not address the Strike Division or the Brigadist Division designs. The composition of assets in the FSB and FSC of the Force XXI division are changing constantly as the army tries to find the best mix of equipment and personnel. The capability figures are based on Data received from the Combined Arms Support Command (CASCOM) liaison officer to the Combined Arms Center (CAC) as of September 24, 1997. Finally, this paper will not address Operations Other Than War (OOTW) and the impact that those operations will have on the logistics structure under study.

CHAPTER II: DOCTRINE

“Doctrine is the statement of how America’s Army, as part of a joint team, intends to conduct war and operations other than war.”⁵

FM 100-5
Operations
June 1993

Section 1. Introduction

A change in doctrine can be the direct cause of a change in the structure of an organization. Logistic organizations undergo changes in order to support the manner in which ground forces expect to fight. The purpose of this chapter is to examine present doctrine and Force XXI emerging doctrine and to determine how the changes anticipated in doctrine will affect the maneuver commander. This will set the conditions in which we will be able to analyze the new Force XXI logistics structure. This portion of the paper will use FM 100-5 (June 1993), TRADOC PAMPHLET 525-5, TRADOC PAMPHLET 525-200-6, FM 100-10 and FM 100-5 (August 1997) (Final Draft) to assess current and future doctrine.

Section 2. Functions and Characteristics

Logistic functions are those support tasks that must take place to ensure success on the battlefield. These basic functions must all occur in order to maintain the maneuver commander’s combat power. They apply equally to both current and future doctrine.

Logistical characteristics are those traits or attributes that describe the planning and execution of logistic operations. They are key considerations for the maneuver

commander in that their presence ensures continuity of support to his unit. Logistical planners must develop plans and execute operations in accordance with the desired characteristics in order to maximize the effectiveness of support operations within the brigade. Logistical characteristics vary according to values emphasized in the doctrine of a particular period.

Section 3. Current Doctrine

Current support doctrine breaks the supporter's tasks into the functions of manning, arming, fueling, fixing, moving, and sustaining the soldiers and their systems. By breaking support operations into these discrete functions, the logistician creates a framework to support the commander's concept of operations. These are the critical functions that must be carried out by the unit's logistic structure to ensure the success of the maneuver unit commander.⁶

Manning the force pertains to ensuring the commander has the right personnel to accomplish the mission.⁷ In the new age of modern weapon systems this not only includes the proper mix of soldiers and Military Occupation Specialties (MOS) but also civilian personnel. Logisticians coordinate with the replacement, medical, and personnel systems, in CONUS and the theater of operations, to ensure the supported commander gets the right person for each task at the right time. The manning function ensures the commander's combat power is maximized. The replacement system supports the commander with new personnel to the unit and is an integral part of Weapon System Replacement Operations (WSRO) that seeks to provide replacement weapons with fully qualified crews assigned. The medical system ensures the commander's assigned

personnel are cared for when injured. The system returns to duty those personnel that do not have to be evacuated from the theater of operations. The commander's personnel system deals with administrative needs. This directly contributes to the moral of the soldiers under his care.

Arming the force is a critical battlefield task that is time sensitive. It can mean life or death on the modern battlefield. New weapon systems use a variety of munitions and a high tonnage of ammunition. This means the arming function must maximize the use of transportation systems, ammunition maintenance capabilities, and flexible supply systems to ensure the resupply of the brigade in a timely manner.⁸ Due to the high tonnage, and the irregular pattern of requests the ammunition system produces, the supply system must be fast, flexible and robust to meet the needs of the brigade commander.

Fueling the force is as important as arming the force. This function will require combat service support units to anticipate the need for fuel in order to support the maneuver commander. Vehicles that are able to keep up with new and modern weapon systems will be a necessity. Combat operations depend on the movement of people and things on the battlefield. This is only possible by fueling the force in a timely manner. Efficient and flexible fueling gives the brigade commander the freedom to maneuver personnel and weapon systems on the battlefield to gain positional advantage over the enemy. In order to allow the commander this freedom of movement, logisticians must be able to anticipate and forecast unit requirements accurately in order to provide fuel at the right time and place.⁹

Fixing the force requires highly skilled personnel adept in the intricacies of complex weapon systems. This function ensures the maximum availability of weapon systems thus ensuring the maneuver commander has the greatest possible combat power available to accomplish the mission.¹⁰ This function involves the repair, recovery and maintenance of weapon systems.

The function of moving is key to all that the logistician does in support of combat operations. The movement of fuel, ammunition, food, casualties, repair parts and personnel are critical to sustaining the maneuver commander. Movement systems must be able to go where the combat forces are located, as far forward on the battlefield as possible. The moving function is not just the physical aspect of moving supplies, equipment, fuel, casualties, food, clothing, and ammunition on the battlefield, but is also associated with the management of transportation assets and the planning of the utilization of those assets to maximize their effects on the battlefield in support of the maneuver commander.¹¹

Sustaining soldiers and their systems includes personnel service support which enhances the soldiers' morale by ensuring their basic needs are taken care of. It includes combat health support, which sustains the combat power of maneuver units by returning soldiers to duty in a timely fashion; field service support which enhances quality of life; and general supply support which provides water, food, and major end items such as trucks, tanks, and artillery to name a few. This function has a direct impact on readiness and affects the soldiers will to fight.¹²

In conclusion, the logistic functions collectively describe the processes for which logisticians must plan and which they must execute in order for the maneuver

commander to be successful in war. These functions may not be ignored. All are important and must be given the highest level of continuous consideration. Performance of these functions enable the brigade commander to conduct operations. If anyone of the functions of manning, arming, fueling, fixing, moving, and sustaining the soldiers and their systems is overlooked the battle may be lost. It is the logistician's duty to ensure this doesn't happen.

It is extremely important to understand the tactical functions of logistics, but it is equally important to understand the characteristics of CSS operations. The characteristics of contemporary CSS operations are anticipation, simplicity, responsiveness, economy, flexibility, integration, attainability, sustainability, survivability and improvisation. These are the distinguishing traits sought in planning and executing logistic operations.¹³ Although all characteristics are important, some are more important than others, depending on the tactical situation. The characteristics serve to identify how the supporting unit will conduct logistic operations in support of the brigade. "The characteristics of support operations are not a checklist but rather a guide for analytical thinking and prudent planning."¹⁴

Anticipation is the ability to foresee logistic requirements in future operations.¹⁵ Anticipation is critical to the success of logistic operations. Getting the concept of anticipation of logistic requirements right, ensures the flexibility of the supported maneuver commander and allows him freedom of movement by ensuring the commander has what he needs just when he needs it with minimal reserves. In order to anticipate the requirements of the brigade, the logistician must be tactically and technically competent. He must be forward looking and plan for all possibilities so he can react in a timely

manner to the requests of the supported unit. In order to accomplish this, he requires continuous, timely, and reliable information about the logistic status of the units he is supporting.

Simplicity is a keystone to the execution and planning of successful operations. It reduces the realm of uncertainty in logistic operations making them more manageable and reliable.¹⁶ The adherence to this characteristic will increase the confidence in the support system. By ensuring your support plan is simple, the fog and friction of war to which Clausewitz so famously eluded¹⁷ is mitigated.

Responsiveness involves rapid, reliable support on demand.¹⁸ Responsiveness increases the flexibility of the maneuver commander and should be applied to all combat service support operations. Supporting forward is the key to responsiveness and should be an accepted practice in all combat service support operations. Responsive logistics gives confidence to the maneuver commander since it builds his confidence that the logistics system will not fail him at the crucial moment.

Resources are becoming more limited and the army is frequently asked to do more with less. Economy of resources is important and requires the commander to set priorities in the allocation. The idea of economy reflects this but supplies must still be robust enough to eliminate the friction and uncertainty in war.¹⁹ Economy gained through efficient stockage ensures the mobility of the support unit and the increased capability of the logistician to keep pace with the maneuver units by decreasing the volume and weight of supplies requiring movement. Further, economy frees critical supplies for use by units with immediate need. Ultimately, economy decreases the requirement for transportation assets as they are not being tied up storing and moving an

unnecessary volume of supplies.²⁰ Economy applied properly ensures that the maneuver commander has the right items, not just quantities of items, thus, he and his logistic assets are more mobile.

Flexibility is the ability to adapt rapidly to changing situations. This means the CSS structure must be able to respond to the fluid changes on the battlefield. Flexibility is enhanced when support soldiers have the foresight to anticipate requirements and the adaptability to adjust to unanticipated requirements. This will increase confidence in the logistic system and is another factor in relieving the maneuver commander of logistic concerns.

Integration brings together logistic plans and operations.²¹ This degree of integration is critical to the synchronization of the Battlefield Operating Systems (BOS). It allows the maneuver commander to maximize combat power at a decisive point in the battle by synchronizing the brigade's critical systems. Integration is also required to obtain greater efficiency in the interaction of the other services and multi-national logistic systems.

Attainability is the concept of having at least the minimum required services and supplies available prior to the beginning of action.²² This will ensure the maneuver commander has the required supplies and services prior to beginning an engagement and gives him the necessary logistics to fight the battle in accordance with his tactical plans.

Sustainability is the ability to keep the forces on the battlefield supplied throughout the battle. The keys to sustainability are the availability of supplies and the capability to move the supplies on the battlefield in a timely manner. This ensures the

commander has the required assets to finish the battle without a pause because of a lack of logistics.

Survivability involves the ability of support soldiers and key logistic systems to survive on the battlefield. It is essential to sustaining combat service support operations on the battlefield. In order to accomplish this task there must be a level of redundancy in critical logistic equipment and supplies. However, the concept of redundancy in equipment and supplies is in opposition to the characteristic of economy,²³ therefore seeking after one characteristic must be balanced by due regard for the other.

Survivability of logistic assets ensures the freedom of movement of the brigade's combat units.

Lastly, improvisation is the ability to make do with whatever happens to be at hand.²⁴ This is a talent and an art that logisticians have shown throughout the history of war. It is a talent that is especially necessary on the battlefield which is the realm of uncertainty and chance. The ability for logisticians to improvise is a major asset to the brigade commander. It allows him to continue to fight when adverse conditions would suggest he could not. Improvisation in logistic matters should be transparent to the supported unit.

Characteristics are the systemic traits sought by the logistician in planning and executing logistic operations in support of the maneuver units. Their presence insures flexibility and continuity of combat operations and enables the commander's success on the battlefield.

In conclusion current doctrine breaks tactical logistics down into the battlefield functions of manning, arming, fueling, fixing, moving and sustaining the soldier and his

systems. The characteristics of combat service support are traits that must be present in order to provide the best support to the maneuver commander. These ideas ensure continuity of operations and flexible support to the maneuver commander.

Section 4. Future Doctrine

“As armies seek to survive, formations will be more dispersed, contributing to the empty battlefield. Commanders will seek to avoid linear actions, close-in combat, stable fronts, and long operational pauses.”²⁵ This statement, from TRADOC PAMPHLET (PAM) 525-5, is a challenge in itself to logisticians of the 21st century. It implies deep maneuver, nonlinear operations and a dispersion of soldiers not formally seen on any battlefield, past or present. To accommodate this in a constrained environment, CSS operators will need systems that will enable greater efficiencies in logistic operations.

The “common, relevant picture of the battlefield coupled with the information provided by a fully integrated combat service support system (ICS³) will allow the Force XXI CSS commander to anticipate requirements and project support further forward than ever before.”²⁶

With a more dispersed battlefield, logisticians must have a greater awareness of the enemy, his location, and capabilities. Further, the logistician must have the capability to provide “anticipatory, responsive, flexible, and versatile support, while remaining able to fight and protect themselves as they maneuver on the battlefield.”²⁷ This will require greater situational awareness of his own force and a more versatile and flexible organization. The CSS support structure in divisions will be multifunctional, modular, and highly mobile in order to support linear and non linear operations. The ability to anticipate logistic requirements coupled with support units supporting far forward will ensure rapid and timely support to the maneuver commander’s units.

TRADOC PAM 525-5 says, "Tactical logistics is the synchronization of all logistics activities required to sustain soldiers and their systems."²⁸ The focus of tactical logistics remains the same manning, arming, fueling, fixing, moving, and sustaining soldiers and their systems. The logistic functions are the same, however, the method in which information about the functions is acquired is clearly different and much more efficient in detail and timeliness. The future CSS commander will emphasize five new logistic characteristics to plan and execute support to maneuver units. Changes in characteristics are required because of the versatility of the threat our forces are expected to face. These new characteristics are doctrinal flexibility, strategic mobility, tailorability and modularity of units, joint and multinational connectivity, and versatility in War and Operations Other Than War (OOTW).²⁹

Doctrinal flexibility is the ability of leaders to apply doctrinal principles in ways as varied as the scenarios they may face.³⁰ For CSS operations the positioning of units and the way in which support is executed must vary according to the scenario faced. The flexibility derived from having modular units will increase the maneuver commander's options. It will allow the maneuver commander to weight the battle at the decisive point and to gain more responsive support by placing support units well forward on the battlefield. He will be able to accomplish this because the support units will be smaller and more mobile while still being able to provide a full range of capabilities to the supported unit. This gives the maneuver commander the latitude of having different tactics, techniques and procedures according to the scenario faced. It is this last capability that marks doctrine as flexible.

Strategic mobility is an important part of Force XXI doctrine in light of the fact that the U.S. Army is becoming a Continental United States (CONUS) based force. The requirement for rapid long distance deployment at the outset of an operation requires that logisticians both lighten units and use the concept of split-base operations to minimize actual deployment requirements.³¹ Austerity of third world environments to which the army may be deployed, where there will be little infrastructure or contracting options, requires that support organizations be robust and have a full range of capabilities.

The cornerstone of the Force XXI concept is modularity in all CSS units.³² Modularity is a characteristic of a unit that means the unit is self-contained, designed to perform a specific function, and can be replaced by another unit of the same design without degradation to the system. Modularity in CSS units ensure a likeness in capabilities and these capabilities are multifunctional in nature so as to permit plugging a type CSS unit into an organization and have supply, medical, and maintenance functions without the reorganization of many logistic units to fulfill the same purpose. This characteristic enables the maneuver commander to build battalion task forces quickly, with all the logistic capability required while still having the same capabilities left for other units in the brigade. The ability to create unique mission related force packages is called tailoring.

Modularity also allows the maneuver commander to deploy battalion-size elements with a logistic unit that is not 'add hoc', that has a structured chain of command, and works as a team. During brigade operations, modularity will allow a CSS unit in the form of a Forward Support Company (FSC) the ability to support forward without degrading the ability of the FSB to support the rest of the brigade. This gives the

brigade commander greater flexibility in designing his plans and operations. Modularity allows a smaller support package to deploy while still having all the necessary capabilities to support a battalion size force. This contributes to the ability to deploy these units faster while saving space in the form of airframes.

Joint multinational and interagency connectivity is a must for future operations. The U.S. Army will normally deploy as part of a task force that may include allies. It is important that the logistic system is flexible enough to accommodate allied support requirements when necessary and allow U.S. forces the ability to plug into their logistic systems when possible.³³

Versatility in War and OOTW means that the force of the future must be able to accomplish its war mission as well as OOTW missions. In the age of decreasing budgets the American people can't afford to maintain two separate forces.³⁴ The force of the future must be able to accomplish a multitude of tasks associated with war and OOTW. "Well-trained and disciplined units, provided with sufficient time and resources to train, can transition to OOTW missions as required."³⁵

The future logistic characteristics of the Force XXI brigade will enable the planning and execution of logistical operations under a broad range of situations. The future logistician must apply these characteristics to maximize the combat power of the maneuver commander and conform to the brigades tactical plans.

In conclusion "Rapid force projection from Continental United States (CONUS), extended lines of communication, and potential forcible entry into logistically bare-based areas of operations require Army development of a logistics system that is versatile, deployable, and expansible."³⁶ This will require attention to a new set of logistic

characteristics while performing the traditional functions of manning, arming, fueling, fixing, moving, and sustaining the soldiers and their systems. Force XXI logistics will be timely and accurate with full asset visibility realized by accurate reporting through the information systems. The focus for the tactical logistician will be forward while having detailed visibility of supplies coming from CONUS. The relevant common picture will allow the CSS units to have greater survivability on the battlefield and an ability to anticipate logistic requirements to a greater degree than before. These concepts provide a combat multiplier for the maneuver commander and will in effect allow him more freedom of action in selecting where he can deploy and fight.

CHAPTER III: ORGANIZATION AND CAPABILITIES COMPARED

“Perhaps for the first time in history, humankind has the capacity to create far more information than anyone can absorb, to foster far greater interdependency than anyone can manage, and to accelerate change far faster than anyone’s ability to keep pace.”³⁷

The Fifth Discipline
Peter M. Senge

Section 1. Introduction

The purpose of this chapter is to analyze the differences, at brigade level, in current logistic organizational structure and Force XXI organizational structure. This chapter will also explore the differences in capabilities of the two organizations and then, finally, come to a conclusion highlighting the major differences in organization and capabilities. This chapter is essential to give the reader an understanding of logistic structure and an analysis of the effect on capabilities resulting as a consequence of anticipated consolidation. From this conclusion it will be possible to determine if the Force XXI structure supports the maneuver commander.

Section 2. Current FSB Structure

The information for the structure and capabilities of the current FSB are located in FM 63-20. In a heavy division, there is one FSB providing direct support (DS) to each maneuver brigade in the Division. The FSB is responsible to support the combat units of the brigade as well as the combat service, and combat service support units that are part of the brigade slice. The companies organic to the FSB are the headquarters detachment, supply company, medical company and maintenance company.³⁸ Normally the maintenance company augments the combat battalions with maintenance teams in the

form of Maintenance Support Teams (MST's). These support teams increase the organic capability of the maneuver battalion maintenance organization and serve to fix equipment as far forward on the battlefield as possible.

Current FSB Structure

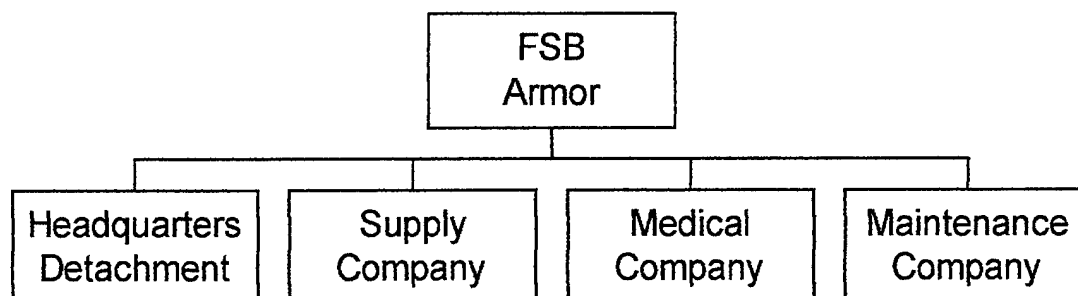


Figure 1. Current FSB structure for a Heavy Division.³⁹

The supply company of the FSB is responsible for receiving and issuing Class I, II, III packaged, limited Class IV, and VII. In addition to these critical items, the supply company provides bulk fuel to the brigade and its associated units, and transloads class V ammunition from corps transportation assets using its own organic forklift assets. In addition to issuing and receiving supplies, the company has the capability to operate a salvage point for all classes of supplies except aviation, Class V, COMSEC equipment, and Medical supplies.⁴⁰ In order to accomplish these tasks the supply company is organized as outlined in Figure 2.

Supply Company FSB

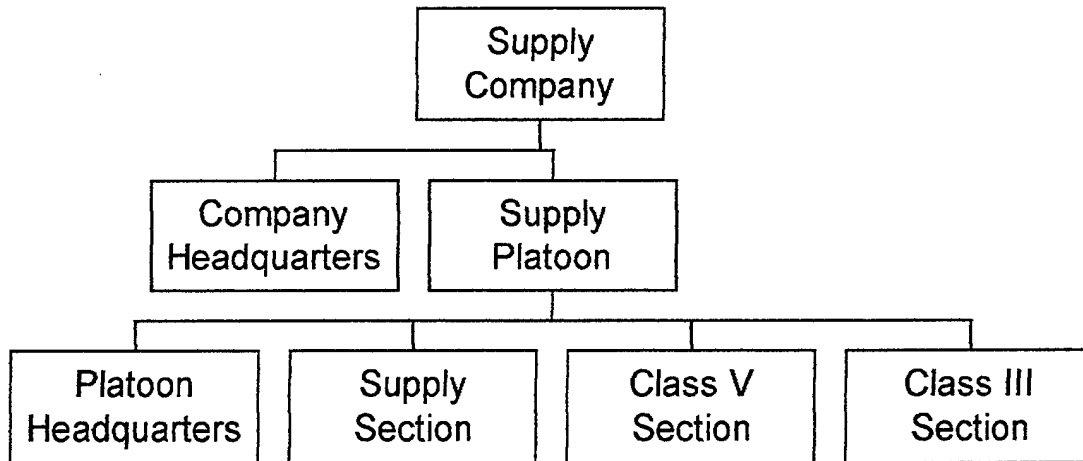


Figure 2. Supply Company Organization Chart.⁴¹

The company headquarters is responsible for administration, unit supply support, NBC operations, and command and control.⁴² The organic maintenance capability in the company resides in the company headquarters and provides maintenance support to the company's logistic equipment as well as recovery support. The supply platoon receives and issues the classes of supply mentioned above. The supply company provides water support to the brigade when augmented by a water team from the Main Support Battalion (MSB).

The FSB's maintenance company provides DS maintenance support to units of the brigade. The maintenance company habitually sends MSTs down to battalion level to fix equipment as far forward as possible. Fixing equipment forward is a critical necessity to increase the combat power available to the brigade commander. The maintenance company stores and manages the brigade's Authorized Stockage List (ASL). In addition, the maintenance company provides backup recovery support to the units of the brigade. Further, the maintenance company provides technical advice and repair of

communications, engineer, power generation, quartermaster equipment, artillery, track, small arms, and wheeled vehicles.⁴³ The maintenance company is organized as listed in Figure 3.

The maintenance company headquarters provides command and control, unit supply, and NBC capability. The maintenance control section provides the control of all the maintenance shop functions. This section schedules all work through the shops and sets the priorities for work based on the brigade commander's guidance. The service recovery section advises on the recovery of damaged or stuck equipment. Further, this section provides the company's heavy lift, welding and body repair. The Class IX support section manages the brigade's ASL. The system support teams form the nucleus of the MSTs sent out to the battalion maintenance collection points.⁴⁴ These teams fix equipment well forward on the battlefield.

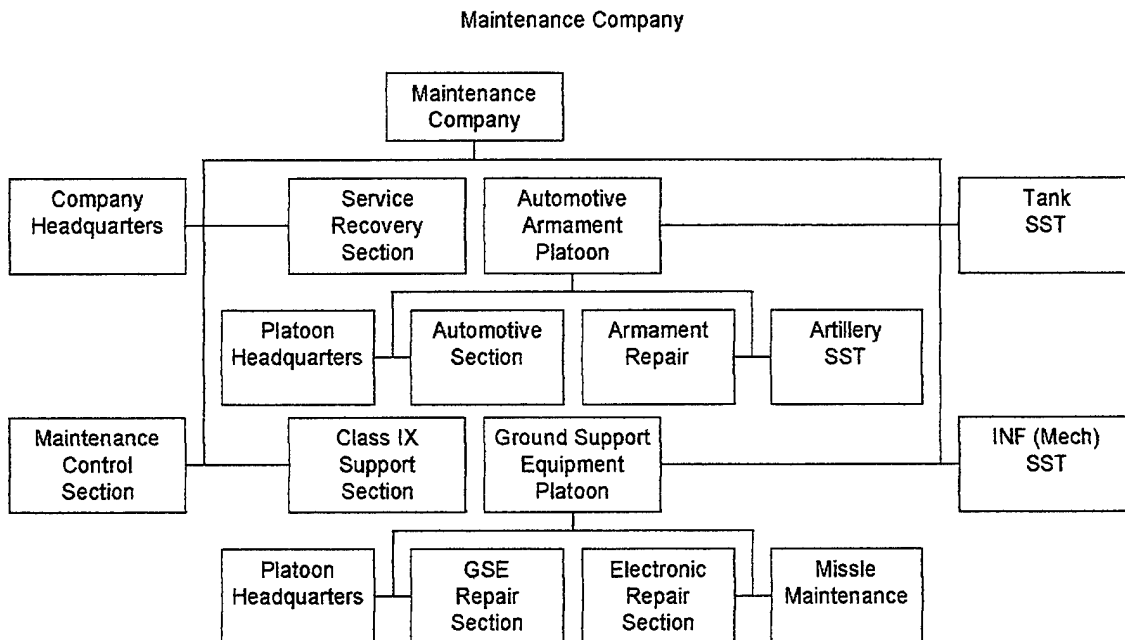


Figure 3. The maintenance company of the FSB.⁴⁵

The company's Automotive/Armament platoon consists of the platoon headquarters, automotive section, armament section, and artillery SST. The automotive section fixes transmissions, engines, hydraulics, and power plants on tracked and wheeled vehicles. The armament section works on fire control systems, turret systems, and small arms, to name just a few. The artillery SSTs provide DS to the brigades artillery battalion.⁴⁶ The company's ground support equipment platoon provides DS support to repair engineer equipment in support of the brigade. It is also capable of repairing radios, water purification units, as well as generators, and refrigeration equipment.

The FSB's Medical company is responsible for treating casualties in the brigade area. The company performs ground evacuation operations, mass casualty operations, emergency dental care, emergency medical resupply to the combat battalion's medics, and operates facilities to hold patients for a limited time.⁴⁷ The organization of the medical company is shown in figure 4.

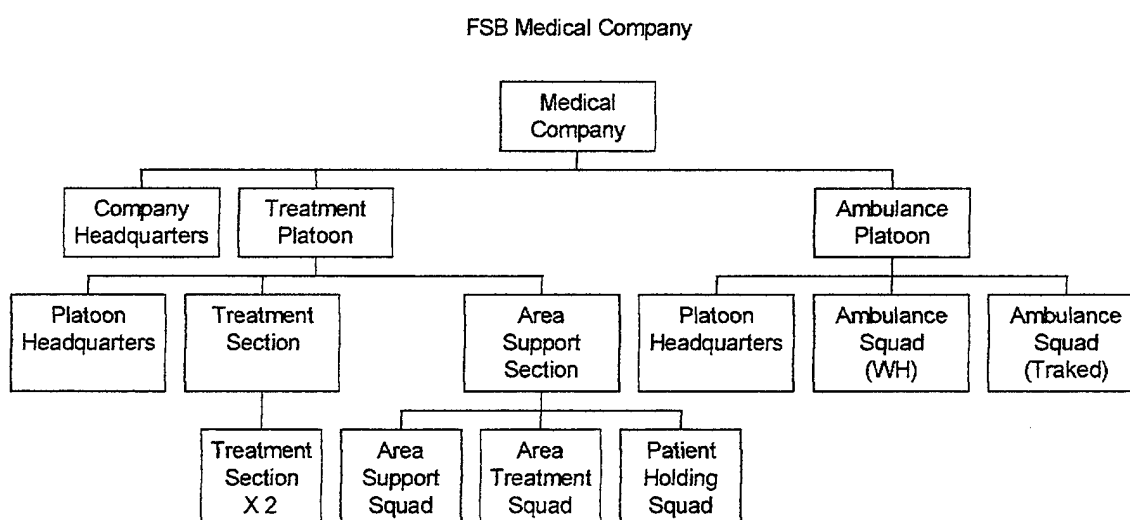


Figure 4. FSB Medical Company Organization.⁴⁸

The medical company headquarters provides administrative support to the unit along with NBC operations, unit supply functions, communications, and command and control of the unit and to those elements that may be attached. In addition the company headquarters provides Class VIII distribution point to units in the brigade area. The treatment platoon operates a 40 bed holding facility in the Brigade Support Area (BSA). There it receives, provides triage among casualties, retains or evacuates patients in the facility.⁴⁹ The ambulance platoon evacuates patients from the battalion aid stations to the patient holding area in the BSA. This platoon also establishes and plans Ambulance Exchange Points (AXPs) for ground and air evacuation.⁵⁰

In conclusion the current FSB structure provides many capabilities to the supported maneuver commander. This structure provides all of the logistic functions of manning, arming, fueling, fixing, moving, and sustaining the soldier and his equipment. Most of the FSB's operations are conducted in the Brigade Support Area (BSA) as to provide 'one stop shopping' for the units in the brigade. The companies in the current structure are functional in nature. Planning of support operations is centralized at the battalion level. The next section of this paper will address the support structure of the Force XXI FSB.

Section 3. Force XXI FSB

Information regarding the structure of the Force XXI FSB is contained in CSS Operations in Support of Force XXI Division Redesign (September 3, 1996) (Final Draft). The Force XXI FSB is composed of a Headquarters and Headquarters Company (HHC), a Base Support Company (BSC), medical company, and three Forward Support

Companies (FSC).⁵¹ In addition, the BSC and the FSCs are multi-functional. The BSC contains maintenance and supply capability while the FSCs contain a maintenance, supply and medical capability. The FSB is structured for support of either an armored or a mechanized brigade where as the FSCs are structured to support either an armored or mechanized battalion within the brigade. The units organic to the FSB will be grouped into organizations comprising the BSA and units forward of the BSA. The FSB is a multifunctional unit that provides DS services and support to elements of the brigade combat team. Because of the FSB's modularity, it has the capability to operate in a dispersed manner over the battlefield. Like the current FSB structure, the Force XXI FSB has a wide range of capabilities that provide the brigade with all classes of supplies. The FSB provides the brigade commander with great flexibility due to its modular design and ability to perform its mission closer to the Forward Line of Troops (FLOT).⁵² The design of the FSB seeks to consolidate logistic functions thereby increasing efficiency and reducing functions that are redundant in nature thus, giving a benefit to the army in the form of reduction in manpower and equipment.

This paper will use an armor brigade organizational structure in analyzing and comparing the Force XXI structure to the current brigade logistics structure. The Force XXI FSB structure is depicted in Figure 5.

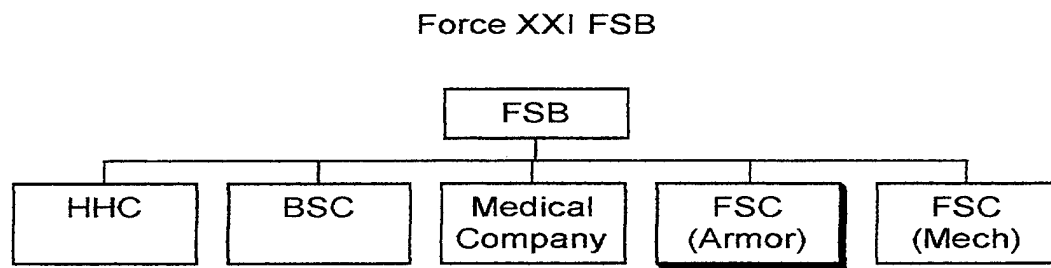


Figure 5. Organizational structure of an armor FSB in a Force XXI Division.⁵³

The HHC of the FSB is responsible for the administration support for the battalion as well as command and control. The HHC provides distribution management of all classes of supplies via the Support Operations section as well as food service to sections within the company, BSC and medical company personnel. The HHC is organized as shown in Figure 6.

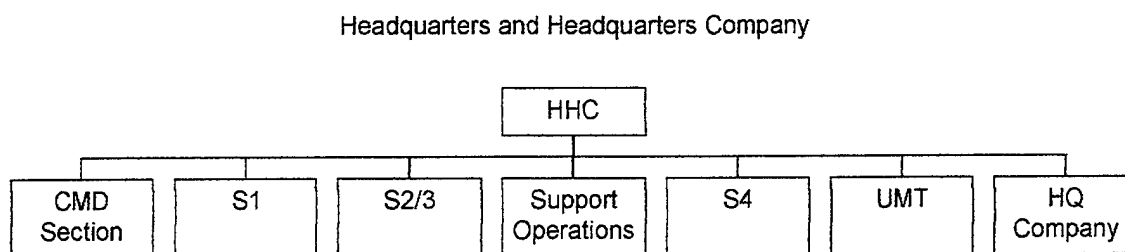


Figure 6. Organizational structure of the Headquarters and Headquarters Company.⁵⁴

The S1 section of the HHC is responsible to the FSB commander for the function of manning in the battalion. The S2/3 section plans the defense of the BSA and integrates the other occupants of the BSA into that defense. The Support Operations section, in conjunction with the brigade S4, plans the logistic support for the brigade. The battalion S4 is responsible for internal supply issues. The Unit Ministry Team (UMT) provides spiritual guidance to the soldiers of the battalion as well as brigade soldiers admitted to the medical company's patient holding facilities.

The BSC is a multifunctional organization that provides logistic support, less medical, to units in the brigade rear area. The BSC may also provide limited backup support to the FSCs.⁵⁵ The BSC is composed of a supply and transportation platoon, an automotive maintenance platoon and a headquarters section. The structure of the BSC is depicted in Figure 7.

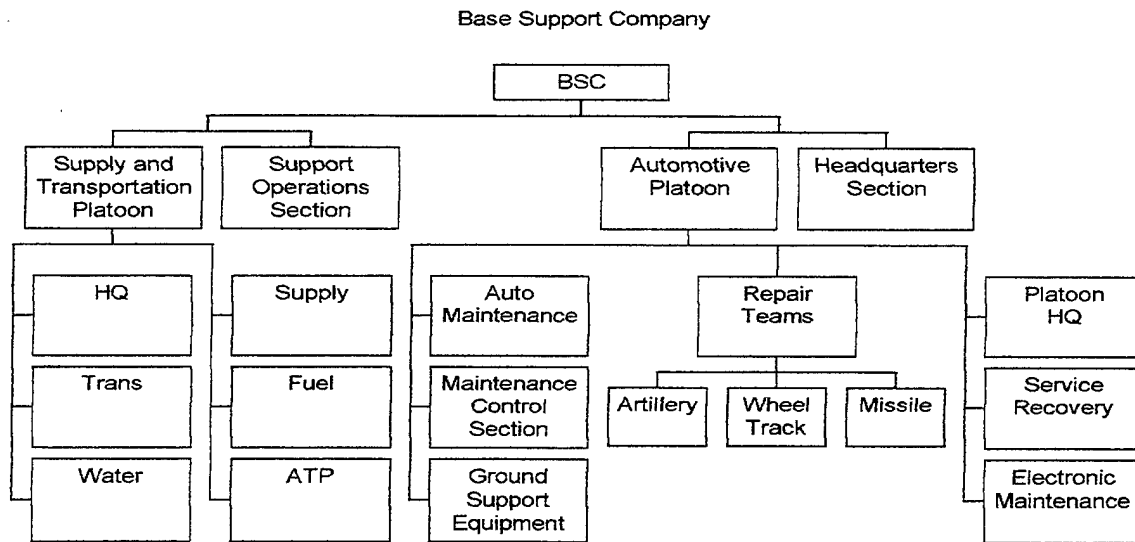


Figure 7. The Base Support Company organization.⁵⁶

The BSC headquarters element provides command and control for the company along with NBC operations. It is responsible for coordinating area support for those units in the brigade rear and provides coordination for backup support to the FSCs as needed.⁵⁷ The major differences in the headquarters future and the headquarters of a current support company is the addition of a support operations section. This allows the BSC commander to provide flexible and uninterrupted support to units in the rear area by having a permanent planning cell to anticipate unit requirements thus adding flexibility to the brigade commander's scheme of maneuver.

The supply and transportation platoon provides the units in the brigade rear area with Class I, II, III(P), IV, VII and IX. Further, this platoon stores and issues the brigade's Class IX ASL.⁵⁸ In addition the fuel section issues and stores bulk Class III for its area support mission and has a DS responsibility to provide fuel support to the FSCs. This platoon also performs the brigade's water mission operating a water point and providing supply point distribution for the units in the brigade rear and distributes water to the FSCs. The transportation section of the company provides transportation support

to all units in the brigade. The ammunition section operates the brigade Ammunition Transfer Point (ATP).⁵⁹

The automotive maintenance platoon provides maintenance support to units in the BSA. In addition, this organization provides DS support to the units in the brigade rear area and DS backup support to the FSCs. The headquarters section provides administrative support to the company. The Maintenance Control Section (MSC) is the controlling activity in this platoon. This section schedules jobs and sets the priority of work in accordance with the brigade commander's guidance. The service and recovery section provides welding support and limited recovery capability to the units in the brigade rear area. The GSE repair section provides maintenance service on generators and refrigeration units. The automotive repair section provides maintenance support to wheeled and tracked vehicles. The missile repair team provides support to TOW, DRAGON and BSFV systems within the brigade; the artillery repair team is in DS of the artillery battalion supporting the brigade; and the wheel track team repairs vehicles assigned to units in the brigade rear and backup support to the FSCs.⁶⁰

In conclusion the BSC is a multifunctional company comprised of supply and maintenance capabilities. The company has an area support role in the brigade rear. This company provides backup support to the FSCs on a limited basis. The company has a support operations section that assists the company commander in planning support operations for units in the brigade rear.

The medical company of the FSB is also located in the BSA with the BSC. The medical company provides Combat Health Service (CHS) support to units operating in the brigade rear area. This company is the only functional company in the FSB and

consists of a company headquarters, preventive medicine section, mental health section, treatment platoon, and an ambulance platoon. The medical company's organization is depicted in Figure 8.

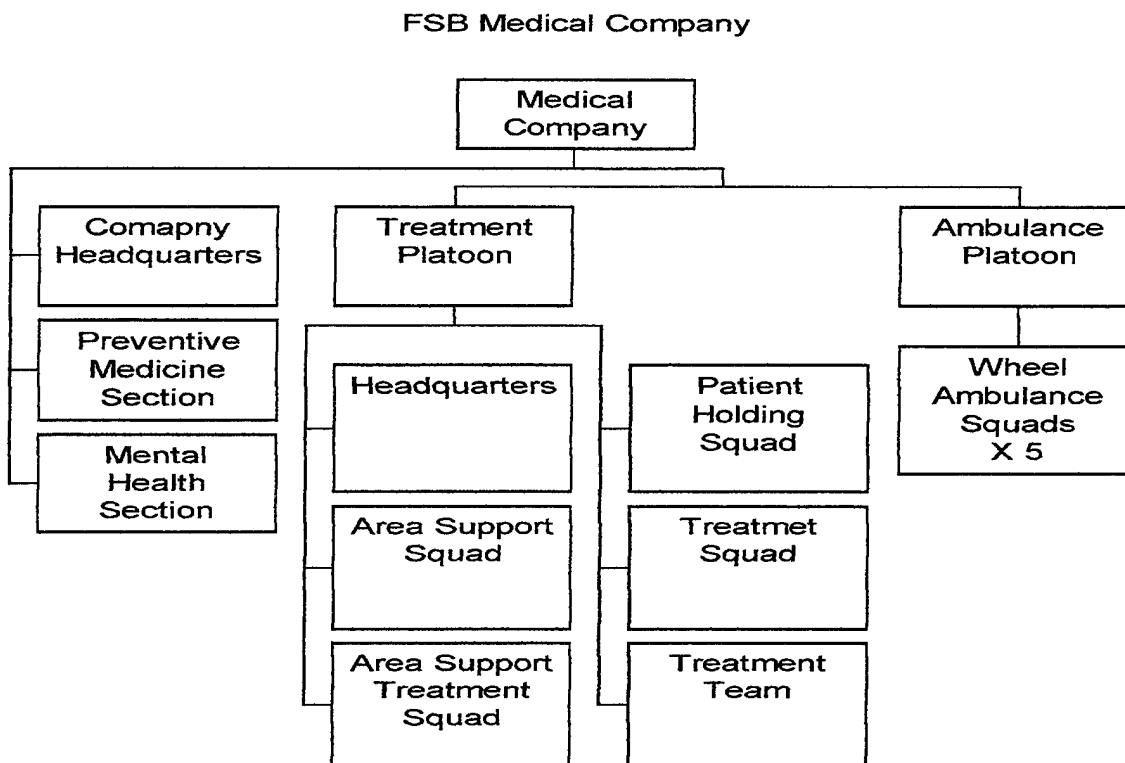


Figure 8. The organization of the FSB Medical Company.⁶¹

The company is capable of providing mental health support, treatment of battle and nonbattle injuries, triage of mass casualties, and stabilization of patients in anticipation of evacuation. Further, this company performs emergency dental care, Class VIII resupply on an area support basis, medical laboratory services, beds for 40 patients, and limited backup support to medical platoons of the FSCs.⁶²

The major differences in the organization of the medical company in the current FSB structure as compared to the Force XXI structure is that the Force XXI structure has added the preventive medicine and mental health sections to the organization. These two sections provide the medical company commander the ability to treat soldiers with battle

fatigue and prevent the outbreak of illness. The addition of these two sections helps the brigade commander sustain his combat power throughout the fight by correcting unsanitary practices within the brigade and treating soldiers with battle fatigue close to the front.

The FSB's FSCs reflect consolidation of the supply, medical, and maintenance platoons previously located in the combat battalion.⁶³ These platoons were consolidated at brigade level and formed the nucleus of the FSCs formed under the command of the FSB commander. The purpose of the FSCs is to provide the full range of combat service support to the combat battalions well forward of the BSA. These companies are multifunctional and maintain little stockage in order to facilitate the company's mobility. The FSC consists of a supply and transportation platoon, a maintenance platoon, a medical platoon, and a company headquarters. The organization of the FSC is depicted in Figure 9.

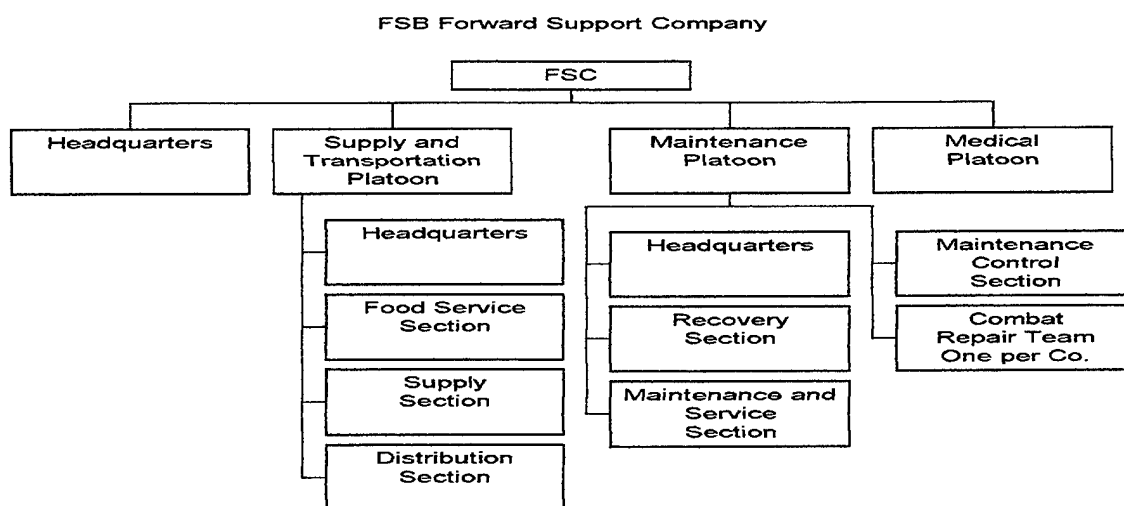


Figure 9. The organization of the Forward Support Company.⁶⁴

The headquarters section of the FSC is responsible to provide administrative support to the soldiers of the company. In addition, the headquarters provides command

and control of all assets assigned or attached in support of the combat battalion. This company provides area support to units operating in the battalion rear area and can provide reinforcing support when directed.⁶⁵ The headquarters section, like the BSC, contains a support operations section that plans logistic support to the battalion. This serves to assist the company commander in conducting his area support mission and his direct support mission to the battalion. This capability allows the battalion commander to focus less on logistics and to concentrate on the battle at hand.

The supply and transportation platoon in the FSCs are the primary providers of supplies and fuel to the combat battalions. This platoon is highly mobile because of the increase in transportation assets and minimum stocks the unit is able to keep on hand. Mobility coupled with technology enhancements, that allow the reduction of stockage, enables the FSC to provide continuity of operations. Increased mobility allows the unit to keep up with the battalions. The supply and transportation platoon provides all classes of supply, less Class VIII. The distribution section provides the resupply of Class III and V and has 10 fuel HEMTTS and 7 cargo HEMTTS.⁶⁶ These assets, far forward, relieve the battalion of the burdensome task of planning and executing their own resupply of fuel and cargo. The food service section provides food support for the soldiers of the FSC and the combat battalion. The supply section provides Class II, III(P), IV, VII, and IX to the combat battalion.⁶⁷

The FSC maintenance platoon provides tactical field maintenance to the supported combat battalion. The use of combat repair teams pushes maintenance support down to the company level.⁶⁸ The maintenance control section coordinates with the BSC to get necessary repair parts and to secure evacuation of equipment from the battalion

Maintenance Collection Point (MCP). The recovery section evacuates broken equipment from the battalion area to the maintenance and service section where the vehicle is repaired or evacuated further.

The medical platoon is responsible for the CHS support of the combat battalion. This platoon provides level 1 medical support and evacuation of wounded from the supported battalion area.⁶⁹ The medical platoon provides company and platoon medics for the supported battalion.

The FSC is most comparable to the current FSB structure. These multifunctional companies have supply, maintenance, and medical support to include a support operations section to plan logistic support of the battalion, coordination with the BSC, and Division Material Management Center (DMMC). This company provides the full range of support to the battalion well forward of the BSA. This unit provides area support to brigade slice units in the battalion area and is capable of providing reinforcing support to other FSCs when directed.⁷⁰

In conclusion, the major differences between the current FSB structure and the Force XXI FSB structure are the multifunctional nature of the companies and the ability of the FSC to provide area support to units in the battalion rear and reinforcing support to the other FSCs when directed. The use of support operation sections in the companies improves the logistic support provided to the battalion and brigade by ensuring there is a section dedicated to the calculation of anticipated needs in commodities from brigade level to battalion level. The addition of the preventive medicine section and the mental health sections to the medical company enables the Force XXI medical company to treat battle fatigue and better guard against non-battle injuries. The creation of FSCs is the

biggest change in that it creates a mini FSB that can be pushed to battalion level to provide logistic support forward on an area basis. These units are modular in nature and capable of supporting any armor battalion or mechanized battalion depending on the composition (Mechanized or Armored). The FSCs or components can be used to reinforce other FSCs thus creating the ability to weight the fight logistically. Because the FSCs are capable of providing area support to brigade units in the battalion area, the logistics tail of these supported units and thus the brigade team is reduced.

In the next section, the paper will compare the capabilities of the current FSB to the Force XXI FSB. This will enable us to identify any shortfalls produced by the new organization.

Section 4. Capabilities and Analysis

The current FSB's mission is to provide direct support to the combat brigade and to the slice units of the brigade operating in the brigade rear area. The brigade's current logistic capability is able to provide the supplies listed in Table 1 for each day of the brigade fight.

Class of supply	Short tons/gal per day ⁷¹
I	17.7
II	16.9
III(p)	1.2
III(b)	158,600 gal/day store / issue
	87,000 gal/day distribute Line haul
	175,000 gal/day distribute local haul
IV	9.3
V	572
IX	5.3 ⁷²

Table 1. Current FSB capabilities.⁷³

In addition to the capabilities above, the medical company can provide 40 beds for the treatment of casualties for up to 72 hours. The total short ton capability of the current FSB is 628.5 short tons a day. If the three maneuver battalions capabilities are added to that figure it increases by 360 short tons. The total fuel the FSB is able to store and issue a day is 58,600 gallons. With the addition of the three maneuver battalions that capability is increased by 100,000 gallons. In order to accomplish this task the FSB has 11 5,000 gallon tankers, 14 5-ton tractors, 3 Palletized Load System (PLS) transports, and 18 demountable PLS cargo beds.⁷⁴

The Force XXI FSB's mission is to provide logistic support to the brigade combat units and those divisional units operating in the brigade area. The Force XXI FSB is capable of providing the logistic support outlined in Table 2.

Class of supply	Short tons/gal per day
I	22
II	5.3
III(P)	2
III(B)	112,500 gal day/ store/issue 225,000 gal/day Line Haul
IV	10
V	734.3
IX	3.9

Table 2. Force XXI FSB capabilities.⁷⁵

The data in Table 2 shows that the Force XXI FSB can haul a total of 777.5 short tons and store 112,500 gallons of fuel in the organic assets of the FSB. The medical capability remains the same as in the current structure with the medical company able to provide a 40 bed capability. These figures take into account all of the equipment available in the FSB at 100% mission capable status.

A Force XXI brigade consisting of two tank battalions, one mechanized battalion, a field artillery battalion, and air defense battalion, two engineer companies, a FSB and a brigade headquarters requires the supplies listed in Table 3.

Class of Supply	Short Tons
I	10.6
II	5.3
III(P)	.81
III(B)	125,150 gal/day
IV	3.3
V	242
IX	3.9

Table 3. Force XXI brigade daily needs.⁷⁶

If we compare the requirements of the brigade and the current and future capabilities shown in Table 4, we see that the short falls in the future structure exist

Class Supply	Brigade Req.	Current FSB	Future FSB
I	10.6 (2xT's, 1xM)	17.7	22
II	5.3	16.9	5.3
III(P)	.81	1.2	2
III(B)	125,150 gal/day	158,600 gal stored	112,500 gal stored
IV	3.3	9.3	10
V	242	572	734.3
IX	3.9	5.3	3.9

Table 4. Brigade requirements versus capabilities.

in Class II, III(B), and IX. However, the battalion altogether has sufficient assets to handle the number of short tons the brigade requires in all classes of supplies given the anticipated technologies and concepts of supply. Although the future structure has less capability to store fuel for the brigade than the current structure this is irrelevant because the future structure has almost enough capability to refuel (12,650 gallons short) the brigade once. With the addition of information systems and sensors the future FSB can, with relative accuracy, predict when the brigade will need fuel and arrange to receive the required fuel in time to refuel the brigade thus minimizing the need to establish fixed fuel

facilities within the brigade area. In addition, the line haul capability of the FSB is more than sufficient to meet the brigade's requirements. This will give the brigade flexibility in options for maneuver warfare. Even though the combat battalions no longer have any organic fuel assets, the FSB still has enough capability to meet the brigade's daily requirement in a high intensity conflict. The robust nature of the support in the FSB is more than adequate to support the Force XXI brigade. This robust support will ensure that the brigade retains flexibility in maneuver and will increase the brigade commander's tactical options.

In conclusion the Force XXI brigade support slice is sufficient to sustain the brigade during high intensity conflict. The future structure ensures the brigade commander has the right support at the decisive point in the battle. The next chapter will discuss Force XXI technology enhancements that will increase the responsiveness of logistics for the brigade and allow the new logistic structure to work at the efficiency anticipated.

CHAPTER IV: FORCE XXI LOGISTIC TECHNOLOGIES

These "Combat Service Support (CSS) materiel requirements ... resolve current deficiencies and implement the long-term goals of Force XXI. These are the near-, mid-, and long-term "enablers" needed to achieve required operational capabilities , implement future concepts, and exploit technological opportunities. These initiatives overcome current deficiencies, facilitate goals of power projection, and anticipate the opportunities and challenges of the emerging Force XXI CSS concepts of Battlespace Logistics."⁷⁷

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Major General
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Section 1. Introduction

The purpose of this chapter is to explore some of the technological advances associated with Force XXI logistics. This portion of the paper will link these advances to improvements in logistic support in the forms of functions and characteristics and how these advances will assist the brigade commander. This chapter will be broken into four parts, a general discussion of the benefits of information technology, specific system enhancements, new equipment technologies, and associated future battlefield concepts. At the end of the chapter we will reach a conclusion on the impacts of technology on the Force XXI maneuver commander.

Section 2. General Benefits of Information Technology

The CSS commander will have some tools to help him accomplish his support mission. They are in the forms of technological advances, such as new equipment, information systems, and logistic concepts, in regards to capabilities and modular organization of support units.

The advance in information technology will affect the CSS commander in three major ways. First, the commander will be able to anticipate logistic requirements better, identify or even predict system breakdowns, and diagnose the problems in systems more efficiently.⁷⁸ This addresses directly the ability to sustain the soldier and his systems. Second, the commander will have greater asset visibility from point of origin to destination in addition to greater asset visibility throughout the brigade.⁷⁹ This will support, more efficiently, the functions of manning, arming, fueling, fixing, and moving. Finally, digitization will allow the commander to command and control CSS functions in near real time through the use of the digitized information systems.⁸⁰

Technological advances will allow the Forward Support Battalion (FSB) commander to anticipate both supply and maintenance requirements for the brigade via appliqué devices installed on the brigade's individual combat vehicles. These devices will be able to show the fuel, ammunition, and maintenance status of each weapon system.⁸¹ This will allow the support commander to anticipate when vehicles will run out of fuel and ammunition, and when a component will fail. This information will be transmitted from the combat vehicle to the Combat Service Support Control System (CSSCS) in a digitized format. Further, the support commander will have visibility of all supplies in the brigade area via the same CSSCS system. This will allow him to utilize support assets more effectively in supporting the brigade commander's priorities as operations are executed. The CSSCS will be discussed in greater detail hereafter.

In order to use logistic assets more efficiently, the FSB commander must know where critical supplies are located in the logistics pipeline. This will be accomplished by a combination of systems. Radio Frequency (RF) tags will allow logistics commanders

to move more supplies by container increasing mobility while allowing identification of specific items in a container. Soldiers will be able to use a laser gun to screen containers to identify the contents thus conserving manpower by reducing unnecessary handling of supplies. CSSCS will keep the support commander informed of the status of command critical items in the brigade and track those command critical items by unit location.⁸² This will allow the FSB commander to react more quickly to critical item requests. It will also help alleviate the burden placed on the supply system when supplies and equipment already on hand are reordered unnecessarily. All of this gives the maneuver commander more flexibility, quicker response time for logistics, greater mobility of his logistic assets, and an awareness of the status of critical items in the brigade.

The digitization of the support unit will help the support commander integrate logistic plans and actions more efficiently with the maneuver plans and operations. This is accomplished through the Maneuver Control System (MCS), also discussed at greater length hereafter. This system will allow the efficient synchronization of the logistic plan with the brigade's maneuver plans and operations. This system allows the support commander to digitize CSS overlays and orders allowing the timely transmittal of these products to user units and higher headquarters.⁸³ MCS will give the FSB commander an unprecedented situational awareness of the battlefield. It allows the logistician to identify the location of friendly and enemy units and assist in planning resupply of those units to avoid enemy interference. The logistician will have the ability, due to in-transit visibility and MCS, to reroute supply vehicles and divert supplies via the appliqué system.⁸⁴ All of these systems ultimately give the brigade commander better and quicker synchronization of logistics efforts.

In summary, technologies will give the maneuver commander increased flexibility in the execution of his tactical plans. Technology will allow the FSB commander to anticipate the brigade's requirements more efficiently while utilizing critical supplies and support assets with precision to weight the tactical fight. Support units will support well forward on the battlefield to give responsive support to the units of the brigade. CSSCS, MCS, and sensors will allow the FSB commander complete visibility of supplies and logistic equipment while giving the commander situational awareness of friendly units as well as enemy units. All of this information will allow him to protect his logistic assets while giving the best support to the brigade's combat units. Further, this will release the brigade from the mountain of material that was required in the past for successful operations.

Section 3. Systems

The two key systems that increase the logistician's capability to process information and logistic data are the Maneuver Control System (MCS) and the Combat Service Support Control System (CSSCS) already mentioned above. MCS is a system designed for the commander. It is designed to shorten the duration of the decision making cycle.⁸⁵ The system is able to do this by applying computer technology to increase the speed of the Deliberate Decision Making Process (DDMP). This enables the logistic commander to provide logistic plans and orders in conjunction with the brigade's plans and orders cycle. This allows the synchronization of CSS assets with maneuver assets. This system also provides the brigade's Relevant Common Picture (RCP). This is useful to the logistic commander because he will know the location of the supported

units as well as his own supporting units. In addition, the RCP shows the picture of the enemy locations. This allows the CSS commander to plan for logistic support out of range of enemy formations thus giving him a level of force protection not previously seen on the battlefield.

The CSSCS computer shows the status of the brigade's supplies. This information can then be used to anticipate the need for critical supplies in the brigade and enables the logistician to become more responsive, increasing the maneuver commander's tactical options. The CSSCS computer shows status of supplies using the RED, AMBER, GREEN, BLACK coding method. Further, the system tracks the brigade's critical items allowing the maneuver commander to see the combat power available in the brigade. This information will enhance his ability to make tactical decisions based on current or near real time equipment and supply status.⁸⁶ All of these aid in decreasing the brigade's decision cycle thus allowing the brigade to react quicker than the enemy.

Section 4. Equipment

Equipment advances also increase the logistic commander's ability to provide responsive support and directly enhance the ability to execute the tactical logistics functions of manning, arming, fueling, fixing, moving, and sustaining the soldier and his equipment. Some of these new systems include Force Provider, RF tags previously mentioned, multi-fuel burners, Tactical Wheeled Vehicles (TWV), driver vision enhancers, improved recovery vehicles, diagnostic test sets, forward repair system, tele-medicine, and the Armored Medical Evacuation Vehicle (AMEV).⁸⁷ These are just a few

of the new equipment technologies available to the CSS commander that can be used to increase the effectiveness of support to the brigade.

Force Provider is a bare-based deployment system that is used to create quick facilities in austere theaters. This support system gives the maneuver commander flexibility in his options of deployment and maneuver. This system provides showers, dining facilities, recreation, and sleeping quarters for deployed forces. Although this system is a corps asset, it can be deployed in support of the brigade. Most notably Force Provider is being used in Bosnia. It is relevant to the brigade commander because it gives the brigade a facility to rest portions of the force and provides infrastructure that would take considerable engineer support otherwise. This system enhances the ability of the logistician to sustain the soldier and his equipment.

Multi-fuel burner technology gives the CSS commander flexibility when operating with other national forces using different types of fuel. The U.S. army currently uses one multi-purpose fuel, JP8. This technology allows burners to use a wide range of fuels thereby increasing possible fuel sources for use in burners.

The new family of tactical vehicles will give logisticians more reliable transportation than they have had in the past. These new transportation assets increase the logistic commander's ability to execute the movement function on the battlefield. These vehicles, coupled with the new test and diagnostic sets, allow the quick diagnosis of mechanical problems. This will enable the logistic commander the ability to keep a higher percentage of tactical vehicles mission capable and enhance the logistic function of fixing. This translates, for the maneuver commander, into more responsive support and flexibility in tactical operations. Coupled with new vehicle technology is the ability

to drive in all conditions. The Driver Vision Enhancer (DVE) will allow truck drivers the ability to operate vehicles comfortably at night while employing only tactical lighting thus, providing protection for the driver and the supplies and equipment he carries in the load. This will increase supply effectiveness to the brigade while increasing the survivability of the brigade's logistic assets thus contributing to the logistic function of moving.

The Forward Repair System (FRS-H) is a self contained system that brings forward the capability to weld, cut, and the utilization of hand powered tools.⁸⁸ This vehicle uses a PLS chassis to transport all the necessary equipment to provide high technological support to weapon systems on site. This allows the logistic commander the ability to fix forward on the battlefield and enables the maneuver commander to keep more combat vehicles operational forward thus, sustaining his combat power.

The Family of Medium Tactical Vehicles (FMTV) wrecker provides 5 ton wrecker support to the FMTVs in the brigade area of operation. This piece of equipment will provide evacuation of vehicles to a repair site or the brigade maintenance collection point.⁸⁹

The Heavy Equipment Recovery Combat Utility Lift and Evacuation System (HERCULES) replaces the M88 recovery vehicle.⁹⁰ The HERCULES is designed to operate in the same harsh environment as the maneuver systems. This vehicle offers protection for the recovery crew and allows the rapid recovery of damaged weapon systems to a maintenance site. This allows the sustainment of the brigade's combat power while providing protection for the maintenance crew operating the vehicle.

The Integrated Family of Test Equipment (IFTE) Contact Test Set (CTS) allows the diagnosis of line replaceable units. It is used at unit level and above.⁹¹ This test set allows the diagnosis of electronics in the brigade's combat equipment facilitating the tactical function of fixing. This test set comes with computerized manuals to troubleshoot numerous pieces of equipment.

Tele-medicine allows doctors working in the BSA the ability to see through the eyes of the medic. This system provides real time medical situational awareness.⁹² Tele-medicine connects doctors to medics to allow the diagnosis of patients and further, allows the doctors to give instructions to the medics on treatment of casualties forward. This system allows doctors input in the initial treatment of a patient thereby increasing the survivability of the patient on the battlefield and increasing the logisticians ability to sustain the soldier while allowing the doctor to stay further back in the brigade area. This capability seeks to sustain the combat power of the brigade by quickly treating casualties thus, allowing quicker recovery time. Further, this system projects expertise farther forward on the battlefield. In addition to tele-medicine, the AMEV provides medical evacuation far forward on the battlefield. This system has the capability to provide emergency medical treatment enroute to the BSA medical facilities. This vehicle also provides a measure of protection for the patient and the medics. This vehicle has increased mobility over the M113 ambulance allowing this vehicle to keep pace with the maneuver forces.⁹³ This provides responsive emergency medical support to soldiers of the brigade.

Section 5. Concepts

There are two new distribution concepts that seek to improve efficiencies of the supply process. These concepts seek to decrease stockage of items at unit level. These concepts are Velocity Management, and Battlefield Distribution. Velocity Management seeks three things. First, it seeks an improved flow of materials and supplies through the supply system while increasing the accuracy of delivered items ordered. Second, it substitutes shorter processing times, velocity, for large masses of supplies. Lastly, it calls for the improvement of processes by eliminating non producing steps while adding productive steps.⁹⁴ This concept allows the logistics commander to travel lighter, thus frees transportation assets to accomplish other missions while allowing the logistics commander the ability to keep pace with the maneuver units of his brigade. Velocity management also enhances the characteristic of strategic mobility and doctrinal flexibility by enabling logistic units to travel lighter and provide support in a variance of scenarios. Further, this enables the logistic commander to move more frequently providing survivability and allowing continuous support to the brigade.

Battlefield Distribution (BD) “is a holistic concept that involves limited organizational restructuring to enhance the functionality of units performing distribution management, leveraging improved technology and re-engineered battlefield operating procedures.”⁹⁵ The concept of battlefield distribution provides the logistic commander with doctrinal flexibility and joint and multinational connectivity by increasing support options and the ability to use joint and host nation assets in this process. The philosophy behind BD is the implementation of a hub and spoke distribution system with a distribution manager at each node. In the brigade area the distribution manager is the

Support Operations Officers.⁹⁶ This reduces the layering effect of supply operations and uses throughput and asset visibility technology already discussed. This concept increases the rate of receiving items and reduces transportation asset usage for long times by hauling items to the hub. This concept relies heavily on RF tag technology.

Section 6. Conclusion

In conclusion, the new systems technologies decrease decision making times allowing the brigade commander the ability to out think the enemy and gain positional advantage on the battlefield. The new logistic technologies enhance the ability of the support commander to execute the tactical functions of logistics and enable the execution and planning of logistical operations for the brigade. These same technologies gives the logistician greater situational awareness of the battlefield and the supplies of the brigade which allow him to anticipate requirements for the brigade more effectively and increase asset visibility. Further, these systems provide an awareness of the location of the enemy thus preserving the logistic assets of the brigade and providing support that is more reliable. The equipment technologies allow logisticians the ability to support further forward on the battlefield which provide the brigade commander with greater responsiveness. These systems are designed to keep pace with the combat systems on the battlefield providing continuity of support to the brigade while offering a higher level of protection for the CSS soldier. This allows the brigade commander to be able to sustain his combat power.

The new distribution concepts give the brigade responsive support while allowing the more effective usage of transportation assets in the brigade. Velocity Management

seeks to reduce the masses of supplies once needed to sustain the brigade thus allowing greater freedom of maneuver for the CSS commander. This increases the survivability of the logistic assets of the brigade while allowing the FSB mobility to keep pace with the combat units. All of these technologies seek to enhance the responsiveness of the support provided to the maneuver commander. They allow logisticians to support farther forward with greater visibility of the critical supplies in the brigade while contributing to the survival of these assets. This is a winning situation for the brigade commander.

The next chapter of this paper is the conclusions from the analysis of doctrine, organization, capabilities, and technology. The conclusions will be based on the facts outlined in the body of the paper and answer the question, What are the implications of Force XXI logistics on the maneuver brigade?

CHAPTER V: CONCLUSION

“The effectiveness of future military operations will be tied to the CSS capability to project, receive, and support the force....Combat operations of the Force XXI division will change the patterns of support for division combat units.”⁹⁷

CSS Operations in Support of
Force XXI Division Redesign
September 3, 1996 (Final Draft)

The research question is; what are the implications of Force XXI logistics for the maneuver commander? The implications are in the form of the benefits the commander gains due to utilization of technology, organizational changes, and emerging doctrinal changes. These benefits, specifically, are increased asset visibility, greater anticipation of supply requirements, logistic support further forward on the battlefield, faster synchronization of logistic assets, greater protection of logistic assets, increased response time, enhanced command and control, modularity in logistic units, and tailorability of CSS assets. These benefits enhance the commander's flexibility and continuity of support on a battlefield that is more lethal and dispersed. The increases in reliability of support to the brigade also increases the logistic commander's ability to execute the tactical logistic functions of manning, arming, fueling, fixing, moving, and sustaining the soldiers and their systems. Further, these benefits allow the CSS commander to realize the characteristics of doctrinal flexibility, strategic mobility, tailorability and modularity, joint and multinational connectivity, and the versatility of function in War and OOTW more effectively in the planning and execution of logistic operations in support of the brigade.

Information systems, coupled with sensor technologies, increase the CSS commander's ability to gain asset visibility over supplies in the brigade area increasing the responsiveness of the support. These systems give the brigade commander flexibility of movement and continuity of operations. Further, these systems seek to increase the commander's situational awareness of the status of critical supplies and weapon systems. This allows him to make quicker and better tactical decisions. These same systems increase the survivability of the brigade's logistic assets by showing the CSS commander the 'common relevant' picture of the battlefield. This allows the logistician to avoid the enemy interrupting continuity of support to the brigade. Further, this technology allows the enhancement of command and control of CSS units. Digitized technology in the form of CSSCS gives the logistician the ability to anticipate the brigade's logistic requirements by giving him real time status of critical supplies. Further, MCS allows the CSS commander to synchronize logistic assets quicker to support the maneuver commander's tactical plan. This allows the maneuver commander the ability to quickly concentrate combat power on the decisive point.

The new organization of the FSB allows the logistician to support the combat units farther forward on the battlefield increasing the responsiveness of logistic support to the battalion commanders. The FSCs provide multifunctional support to units operating in the battalion area to include the battalion itself. This support seeks to shorten the logistic tail of those brigade assets operating in the battalion area while ensuring continuity of operations for the battalion. The modularity of the FSCs enable them to deploy with a battalion task force without disrupting support to the rest of the

units in the brigade. The modularity of the FSC also allows the brigade commander to weight the brigade's fight at the decisive point thus increasing combat power.

These technological advances enable the logistic commander to more effectively execute the tactical functions of manning , arming, fueling, moving and sustaining the soldiers and their equipment. Digitization of logistic forces also serves to allow the employment of logistic characteristics. All of these benefits make Force XXI logistics a bonanza for the maneuver commander providing him with responsive, reliable, flexible, modular, and tailorable support.

ENDNOTES

¹ United States Army Training and Doctrine Command ,TRADOC PAMPHLET 525-5, Force XXI Operations, (Fort Monroe, VA: 1994), 1-1.

² The brigade commander is the primary maneuver commander because he is the owner of the combat assets of the brigade and is responsible for the correct employment of those assets regardless of how he allocates assets to the battalion commanders. This makes the brigade commander the primary maneuver commander.

³ Combined Arms Support Command Final Draft, CSS Operations In Support of Force XXI Division Redesign, (Fort Lee, VA: 1996), 1-11.

⁴ TRADOC PAM 525-5, Force XXI Operations, 1994, 3-15.

⁵ U.S. Army, Field Manual 100-5, Operations, (Washington D.C.: U.S. Government Printing Office, 1993), 1-1.

⁶ U.S. Army, Final Draft of Field Manual 100-5, Operations, (Washington D.C.: U.S. Government Printing Office, 1997), 11-6.

⁷ U.S. Army Field Manual 100-10, Combat Service Support, (Washington D.C.: U.S. Government Printing Office, 1988), 1-14.

⁸ Ibid., 1-14.

⁹ Ibid., 1-14.

¹⁰ Ibid., 1-14.

¹¹ Ibid., 1-14 - 1-15.

¹² Ibid., 1-15.

¹³ Final Draft of Field Manual 100-5, Operations, 1997, 11-7.

¹⁴ Ibid., 11-7.

¹⁵ Ibid., 11-7.

¹⁶ Ibid., 11-7.

¹⁷ Carl Von Clausewitz, "On War" (Translated and Edited by Michael Howard and Peter Paret. Princeton: Princeton Press, 1987), 101.

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- ¹⁸ Final Draft of Field Manual 100-5, Operations, 1997, 11-7.
- ¹⁹ Ibid., 11-8.
- ²⁰ Ibid., 11-8.
- ²¹ Ibid., 11-8.
- ²² Ibid., 11-8.
- ²³ Ibid., 11-8.
- ²⁴ Ibid., 11-8.
- ²⁵ TRADOC PAM 525-5, Force XXI Operations, 1994, 2-9.
- ²⁶ Combined Arms Support Command Final Draft, CSS Operations In Support of Force XXI Division Redesign, 1996, 1-9.
- ²⁷ Ibid., 1-9.
- ²⁸ TRADOC PAM 525-5, Force XXI Operations, 1994, 3-15.
- ²⁹ Ibid., 3-1.
- ³⁰ Ibid., 3-1.
- ³¹ Ibid., 3-2.
- ³² Combined Arms Support Command Final Draft, CSS Operations In Support of Force XXI Division Redesign, 1996, 1-9.
- ³³ TRADOC PAM 525-5, Force XXI Operations, 1994, 3-2.
- ³⁴ Ibid., 3-2.
- ³⁵ Ibid., 3-2.
- ³⁶ United States Army Training and Doctrine Command ,TRADOC PAMPHLET 525-200-6, Combat Service Support, (Fort Monroe, VA: 1994), 3.
- ³⁷ Peter M. Senge, "The Fifth Discipline: The Art & Practice of The Learning Organization", (New York: Doubleday, 1990), 69.
- ³⁸ U.S. Army Field Manual 63-20, Forward Support Battalion, (Washington D.C.: U.S. Government Printing Office, 1990), 2-1.
- ³⁹ Ibid., 2-2.

⁴⁰ Ibid., 7-1.

⁴¹ Ibid., 7-2.

⁴² Ibid., 7-4.

⁴³ Ibid., 8-1.

⁴⁴ Ibid., 8-4 - 8-6.

⁴⁵ Ibid., 8-2.

⁴⁶ Ibid., 8-5.

⁴⁷ Ibid., 9-1.

⁴⁸ Ibid., 9-2.

⁴⁹ Ibid., 9-5.

⁵⁰ Ibid., 9-5.

⁵¹ Combined Arms Support Command Final Draft, CSS Operations In Support of Force XXI Division Redesign, 1996, 2-1.

⁵² Ibid., 2-8.

⁵³ Ibid., 2-8.

⁵⁴ Ibid., 2-9.

⁵⁵ Ibid., 2-13.

⁵⁶ Ibid., 2-13.

⁵⁷ Ibid., 2-13.

⁵⁸ Ibid., 2-14.

⁵⁹ Ibid., 2-14.

⁶⁰ Ibid., 2-15.

⁶¹ Ibid., 2-16.

⁶² Ibid., 2-16.

⁶³ CAC Memorandum, Analysis of Force XXI Division Combat Service Support Structure, (Ft Leavenworth, KS: Director, Department of Logistics and Resource Operations, 15 February 1996), Executive Summary.

⁶⁴ Combined Arms Support Command Final Draft, CSS Operations In Support of Force XXI Division Redesign, 1996, 2-9.

⁶⁵ Ibid., 2-11.

⁶⁶ CAC Memorandum, Analysis of Force XXI Division Combat Service Support Structure, 15 February 1996, Annex M.

⁶⁷ Combined Arms Support Command Final Draft, CSS Operations In Support of Force XXI Division Redesign, 1996, 2-11.

⁶⁸ Ibid., 2-12.

⁶⁹ Ibid., 2-12.

⁷⁰ Ibid., 2-11.

⁷¹ CAC Memorandum, Analysis of Force XXI Division Combat Service Support Structure, 15 February 1996, Annex H-Annex M. With the addition of assets in the battalion supply platoon, the brigade has 8 HEMTTS tankers and 15 additional cargo HEMTTS in a Mechanized Battalion. In an Armor Battalion there are 16 HEMTTS tankers and 15 cargo HEMTTS in the battalion. These assets haul a combined 100,000 gallons of fuel and 360 short tons of cargo for a brigade consisting of two armor battalions and one mechanized battalion in addition to the FSB's assets. The fuel capability in Table 1 reflects the addition of the fuel capability of the three battalions however the cargo capability is not shown in the table.

⁷² The figure for class IX was based on a brigade strength of 4218 personnel. This number was calculated by using U.S. Army Field Manual 101-10-1/1, Staff Officers Field Manual Organizational, Technical, and Logistical Data, Volume 1 (Washington D.C.: U.S. Government Printing Office, 1987), 1-148 - 1-152. Then the Class IX planning factor located in the U.S. Army Command and General Staff College Student Text 101-6, G1/G4 Battle Book, (Fort Leavenworth KS: July 1997), 1-5 was applied to get 5.3 Short Tons of Class IX required for a brigade task force composed of the units outlined in the paper.

⁷³ Student Text 101-6, G1/G4 Battle Book, 1997, 4-14.

⁷⁴ Ibid., 4-16.

⁷⁵ This data was calculated using the MTOE data available from the CASCOM liaison officer to the CAC. This data was valid of September of 1997. However, the rapid

changing nature of the Force XXI structure and equipment makes this information outdated rapidly. The capabilities of the Force XXI FSB was calculated by examining the equipment on the TOE and calculating carrying capacity from the G1/G4 Battle Book, published in July 1997.

⁷⁶ The figures for the needs of a Force XXI brigade were calculated using Prairie Warrior 96 personnel numbers for a brigade task force. The planning factors in the G1/G4 Battle Book were then applied to the numbers to determine a brigade requirement for Class I, II, III(P), III(B), IV, V, and IX. Brigade personnel numbers for the task force described in the paper are 3,157.

⁷⁷ This statement is from the CASCOM executive summary located on the CASCOM home page at http://www.cascom.army.mil/multi/materiel/css_Materiel_Master_Plan/. The executive summary is part of the CASCOM Combat Service Support Materiel Master Plan. General Brown's statement is located on page two.

⁷⁸ Combined Arms Support Command Draft of, U.S. Army Maintenance XXI Concept, (Fort Lee VA: 1997), 6, para 3-4. This information was obtained on the CASCOM home page at www.cascom.army.mil.

⁷⁹ Combined Arms Support Command Final Draft, CSS Operations In Support of Force XXI Division Redesign, 1996, 1-9.

⁸⁰ Ibid., 1-9. This information is also available on the CASCOM web site at <http://132.159.36.16/about.htm>. It is an information sheet on CSSCS.

⁸¹ Ibid., 3-2.

⁸² This information was obtained by hands on practical experience during Prairie Warrior 97 working as the Discom Support Operations Officer for the Mobile Strike Force.

⁸³ This information was gathered through hands on experience during Prairie Warrior 97 by FTPing the Discom's support overlays on the MCS.

⁸⁴ Combined Arms Support Command Final Draft, CSS Operations In Support of Force XXI Division Redesign, 1996, 3-1.

⁸⁵ United States Army Training and Doctrine Command, Operational Requirements Document (ORD) For Maneuver Control System (MCS), (Fort Monroe, VA: August 1995), 1. This document was retrieved off the TRADOC web site with a sub directory off the MCS web site.

⁸⁶ The information on the CSSCS computer came from personal experience working directly with the system during Prairie Warrior 97. Further information was located on the CASCOM web site at <http://132.159.36.16/about.htm>

⁸⁷ Combined Arms Support, Combat Service Support Material Master Plan, (Fort Lee, VA:), 5-8.

⁸⁸ This information is on the CASCOM web page at www.cascom.army.mil/ordnance/materiel/fact_sheet/main_rec/fs-frs.htm

⁸⁹ This information is found on the CASCOM web site at www.cascom.army.mil/ordnance/material/fact_sheet/main_rec/fs_fmtv.htm

⁹⁰ This information is on the CASCOM web page at www.cascom.army.mil/ordnance/material/fact_sheet/main_rec/hercules.htm

⁹¹ This information is on the CASCOM web page at www.cascom.army.mil/ordnance/material/fact_sheet/tmde/contact_test_set_2.htm

⁹² Combined Arms Support Command Fact Sheet for, Medical Communication for Combat Casualty Care (MC4), (Fort Lee, VA:), 1. This fact sheet is available on the CASCOM web page.

⁹³ Combined Arms Support Command Information Paper, Armored Medical Evacuation Vehicle (AMEV), (Fort Lee, VA:), 1. This information paper is available on the CASCOM web page.

⁹⁴ Combined Arms Support Command Briefing on , Velocity Management, (Fort Lee, VA:), 1. This briefing is found on the CASCOM web site at www.cascom.army.mil

⁹⁵ Combined Arms Support Command an information paper on, Battlefield Distribution, (Fort Lee, VA:), 1.

⁹⁶ Ibid., 1.

⁹⁷ Combined Arms Support Command Final Draft, CSS Operations In Support of Force XXI Division Redesign, 1996, 1-9, para 1-1.

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